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The Role of Adapted Physical Activities in Achieving Mental Health Among Children with Autism

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Abstract

Background & Objective: Autism spectrum disorder (ASD) represents a major developmental challenge confronting numerous children worldwide, impairing their capacity to communicate and adapt to society. Autism institutions in the Arab world focus predominantly on psychological and educational interventions, frequently overlooking adapted physical activities (APA). Contemporary research demonstrates that adapted physical activity can play a pivotal role in enhancing mental health among children with autism. This study aims to explore this functional role and propose an operational action plan for integrating adapted physical activities into therapeutic programs for children with autism. Method: In alignment with the nature and objectives of the investigation, a descriptive survey methodology was adopted. The study was administered to a comprehensive survey sample of N = 21 special needs educators working with children with autism at the Specialized Autism Center in M'Sila Province, Algeria (n = 9 in the pilot study and n = 12 in the main study). Data were collected using a structured 21-item questionnaire distributed across three thematic dimensions: aggressive/stereotyped behaviors, irrational behaviors/social interaction, and social communication. Results & Conclusion: The empirical findings revealed that adapted physical and sports activity exerts a statistically significant and substantial positive impact on mitigating various developmental deficits experienced by children with autism ($p = .000$ across all dimensions).

Keywords: *Autism Spectrum Disorder; Adapted Physical Activities; Mental Health; Social Communication.*

1. Introduction, Theoretical Framework, and Literature Review

1.1 Introduction and Background

Autism represents one of the most pressing developmental challenges affecting numerous children worldwide, wherein affected children find themselves confined within a world fraught with communicative and behavioral barriers that impede their adaptation to the surrounding society. With the rising prevalence rates of this disorder, there is an escalating need for scientific research and development across innovative therapeutic domains aimed at improving the quality of life for these children.

Autism institutions across the Arab world—and particularly in Algeria—are characterized by an intense focus on psychological and educational dimensions in treating this disorder, frequently overlooking the paramount importance of adapted physical activities in enhancing mental health and social

communication among these children. Through field visits and direct interaction with the research community in this sector, a pronounced deficiency was observed in educational programs and plans that sufficiently emphasize physical activities as an effective therapeutic instrument for the child with autism.

Comprehending the significance of physical activity among children with autism opens new horizons for improving their quality of life and assisting them in adapting more effectively to their surrounding environment. Accordingly, this contribution aims to highlight the role of adapted physical activities in achieving mental health among children with autism, and to present a comprehensive action plan that ensures coordination among all stakeholders toward realizing the ultimate goal: the integrated and effective inclusion of children with autism into society.

This paper addresses a series of critical points, beginning with the importance of adapted physical activities in treating children with autism, examining their neurological and psychological impacts, and culminating in their effective implementation within educational and community institutions. Furthermore, it reviews the challenges confronting this field and the future opportunities capable of opening new avenues for developing physical activity programs and initiatives for children with autism. Collectively, concerted efforts can achieve a tangible difference in the lives of these children and provide an enabling environment that assists them in developing their capacities and realizing their full potential.

1.2 Statement of the Problem and Research Questions

With the increasing prevalence of autism spectrum disorder and its developmental complexities, autism institutions have encountered substantial challenges in providing effective therapies and programs for affected children. Due to the traditional emphasis on psychological and educational aspects within the therapeutic process, the motor and physical dimensions of these children have largely been neglected. Consequently, the central research problem is formulated as follows:

What is the role of adapted sports activities in achieving mental health among children with autism? And can these adapted activities serve as an effective instrument for enhancing social communication and general well-being for these children within their environment?

From this central problem, the following sub-questions emerge:

- **1.** Does adapted physical activity play a role in mitigating stereotyped behaviors among children with autism?
- **2.** Does adapted physical activity play a role in achieving social interaction among children with autism?
- **3.** Does adapted physical activity play a role in achieving communication capacity among children with autism?

1.3 Research Hypotheses

- • **General Hypothesis:** Adapted sports activities play a statistically significant role in achieving mental health among children with autism.
- • **Sub-Hypothesis 1 (H1):** Adapted physical activity plays a statistically significant role in mitigating stereotyped behaviors among children with autism.
- • **Sub-Hypothesis 2 (H2):** Adapted physical activity plays a statistically significant role in achieving social interaction among children with autism.
- • **Sub-Hypothesis 3 (H3):** Adapted physical activity plays a statistically significant role in achieving communication capacity among children with autism.

1.4 Conceptual and Operational Definitions of Study Terms

1.4.1 Adapted Sports Activities

• **Conceptual Definition:** The American Alliance for Health, Physical Education, and Recreation (AAHPER) defines adapted sports activities as 'a set of developed and diversified programs of athletic

activities and games tailored to the capacities of individuals with disabilities, enabling them to satisfy their desires to practice beneficial sports activities and contributing to the optimal utilization of their abilities' (Helmy & Farhat, 1998, p. 22). Similarly, Helmy and Farhat (1998) define them as 'sports, games, and programs modified to suit disability conditions according to their type and severity, implemented in accordance with the interests of individuals with disabilities and within the limits of their capabilities' (p. 223).

- • **Operational Definition:** Physical activities that have been modified or adapted to suit the needs of individuals with special needs, such as children with autism. These activities are designed to improve physical fitness, motor skills, and social interaction among individuals with special needs.

1.4.2 Autism

• **Conceptual Definition:** Autism is defined as 'a developmental disability that manifests prior to the first three years of a child's life, characterized by deficits in social interaction and communication, wherein autistic individuals exhibit restricted, repetitive, and stereotyped behavioral patterns' (El-Sherbini & Farouk, 2011, p. 23). The World Health Organization (WHO) defines it as 'a developmental disorder appearing in the early years of a child's life that results in deficits in linguistic and social attainment' (Bebbassi, 2016, p. 25).

- • **Operational Definition:** A neurodevelopmental disorder that affects an individual's social communication, behavior, and social interaction. It is characterized by a spectrum of symptoms and difficulties that vary from one person to another, encompassing difficulties in verbal and non-verbal communication, restricted interests, and repetitive behaviors.

1.4.3 Mental Health

• **Conceptual Definition:** The World Health Organization (WHO) defines health as 'a state of complete physical, mental, and social well-being and not merely the absence of disease' (Zahran, 2005, p. 9). Abdel-Ghaffar (2001) defines mental health as 'a state of integration of the individual's various energies that leads to their optimal investment, thereby actualizing their humanity' (p. 2).

- • **Operational Definition:** Mental health encompasses the general state of an individual's mind, emotions, and cognition, including the capacity to cope with challenges and psychological pressures properly and effectively. Mental health is influenced by multiple factors, including the environment, personal experiences, and genetic determinants.

1.4.4 Social Communication

- • **Conceptual Definition:** Social communication denotes all forms of contact and communication necessitated by human social relations and dictated by the vital purposes and living conditions of the individual or group—including educational, instructional, cultural, economic, political, and media purposes—as well as every direct or indirect interaction in which a human being meets and naturally mingles with others through dialogue, discussion, observation, or all of them combined (Al-Maatouk, 1996).
- • **Operational Definition:** The capacity to exchange information and interact with others in effective and appropriate ways; these skills encompass the ability to comprehend body language, express oneself, and engage in verbal and non-verbal communication.

1.5 Review of Previous Empirical Studies

- **1. Study by Sahli (2012):** Examined the role of activities in developing verbal communication skills among children with autism, while also investigating the role of recreational activities in enhancing non-verbal communication skills. Adopting a clinical methodology, the researcher conducted interviews with a clinical psychologist and a specialized educator alongside direct observation on a sample of N = 4 clinical cases of children with autism. The findings demonstrated that recreational activities play a vital role in developing communication skills among children

with autism, including improving joint attention.

- **2. Study by Ladjlat (2012):** Aimed to evaluate the role of collective play in reducing aggressive behaviors among children with autism. Utilizing a clinical approach with a sample of N = 5 children with autism, the findings indicated that collective play contributes significantly to reducing aggressive behaviors among children with autism, including both self-directed and other-directed aggression.
- **3. Study by Khaldoumi (2012):** Investigated the impact of utilizing collective play accompanied by music in developing social and communicative skills among children and adolescents with autism. Employing an experimental design on a sample of N = 7 children with autism, the results revealed statistically significant differences in learning readiness, verbal communication, non-verbal communication, and emotional expression between the pre-test and post-test measurements.
- **4. Study by Mouli Mahi (2008):** Aimed to assess the role of physical and sports activity in reducing psychological stress among physical and sports education teachers and its impact on their job performance. Administered to a sample of N = 30 teachers using an anxiety scale, the results showed that attending to physical, cognitive, psychological, and social dimensions contributes to bodily health, vitality, and agility, thereby positively influencing teachers' occupational performance.
- **5. Study by Ghazal (2007):** Evaluated the effectiveness of a training program in developing social skills among a sample of children with autism in Amman. Utilizing a Social Interaction Rating Checklist for children with autism and a structured social skills training program, the findings demonstrated statistically significant differences between the experimental and control groups in social skills before and after the training intervention.

2. Methods and Field Procedures

2.1 Pilot Study

The pilot study represents a preliminary procedural phase conducted by the researcher to test the research instruments, verify their validity and suitability, and ensure the accuracy of the final empirical findings prior to commencing main fieldwork. The pilot investigation was conducted at the Specialized Center for Autism in M'Sila in order to:

- • Verify the empirical realism of the research problem, prepare a suitable foundation for fieldwork, and anticipate and mitigate potential procedural obstacles.
- • Identify the sample participants and establish the key field implementation protocols required for the empirical investigation.
- • Verify the psychometric properties of the research instrument (validity and reliability).

2.2 Research Design and Methodology

This investigation is grounded in the scientific method, which constitutes the systematic pathway followed by the researcher to attain objective scientific truth. Because the descriptive approach demonstrates high efficacy in uncovering the reality of a phenomenon and describing it accurately, the present study adopted the descriptive survey method (الطلمنهج)الوصفي which aims to describe the phenomenon as it exists in reality and express it quantitatively.

Through this methodological design, precise data were collected regarding the importance of adapted physical activities in improving mental health among children with autism, analyzing the phenomenon quantitatively to understand the impact of these activities on the behaviors and communication of affected children, and formulating evidence-based recommendations for institutional implementation.

2.3 Study Population and Sample

- • **Study Population:** The target population consisted of all special needs educators working at the Specialized Psychological Center for Autism in M'Sila Province, totaling N = 21 educators.

- • **Study Sample:** Given that the total population comprised 21 educators, a comprehensive census survey sample was adopted, encompassing all members of the population: n = 9 educators were assigned to the pilot study, and n = 12 educators constituted the main empirical study sample.

2.4 Data Collection Instrument

A structured questionnaire served as the primary data collection instrument. Note that while the preliminary abstract summarized the thematic areas broadly as aggressive behavior, irrational behaviors, and social communication, the operationalized field instrument was structured into three precise 7-item dimensions (totaling 21 items) scored on a 3-point Likert-type scale (Always = 3, Sometimes = 2, Never = 1):

- • **Dimension 1 (Items 1–7):** The role of adapted sports activities in mitigating stereotyped behaviors among children with autism.
- • **Dimension 2 (Items 8–14):** The role of adapted sports activities in achieving social interaction among children with autism.
- • **Dimension 3 (Items 15–21):** The role of adapted sports activities in achieving communication capacity among children with autism.

2.5 Psychometric Properties of the Instrument

2.5.1 Validity (Intrinsic Validity)

Instrument validity was established by computing the intrinsic validity coefficient (which reflects the internal validity of the test), calculated as the square root of the reliability coefficient according to the following mathematical formula:

Intrinsic Validity Coefficient = √(Reliability Coefficient)

Table 1

Intrinsic Validity Coefficients of the Research Instrument Across Dimensions

Questionnaire Dimensions	Intrinsic Validity Coefficient
Dimension 1: Mitigating Stereotyped Behaviors	0.81
Dimension 2: Achieving Social Interaction	0.79
Dimension 3: Achieving Communication Capacity	0.84
Total Questionnaire Score	0.82

Note. All intrinsic validity coefficients ranged between .79 and .84, indicating a high degree of validity.

As shown in Table 1, all intrinsic validity coefficients were high, ranging between .79 and .84 (with an overall coefficient of .82), demonstrating that the questionnaire possesses an appropriate degree of validity and accurately measures what it was designed to measure.

2.5.2 Reliability (Cronbach's Alpha)

Reliability constitutes a critical prerequisite for the validity of any questionnaire; instrument reliability signifies that consistent responses would be obtained if the instrument were repeatedly administered to the same individuals at different times (Al-Dahsha, 2006, p. 78). Internal consistency reliability was evaluated using Cronbach's alpha coefficient.

Table 2

Cronbach's Alpha Reliability Coefficients of the Research Instrument

Questionnaire Dimensions	Number of Items	Cronbach's Alpha (α)
Dimension 1: Mitigating Stereotyped Behaviors	07	0.66
Dimension 2: Achieving Social Interaction	07	0.63

Questionnaire Dimensions	Number of Items	Cronbach's Alpha (α)
Dimension 3: Achieving Communication Capacity	07	0.72
Total Questionnaire Score	21	0.68

Note. Cronbach's alpha values ranged between .63 and .72 (overall α = .68), satisfying scientific psychometric standards.

2.6 Statistical Methods Used

To verify the research hypotheses, data were analyzed using the Statistical Package for the Social Sciences (SPSS) to compute the following statistical parameters: (1) Intrinsic validity coefficient, (2) Cronbach's alpha reliability coefficient, (3) Arithmetic mean (M), (4) Standard deviation (SD), (5) Hypothetical mean (μ = 14), (6) Shapiro-Wilk test of normality, and (7) One-sample t-test.

3. Empirical Results

3.1 Testing the Normality of Data Distribution

Prior to hypothesis testing, it is necessary to determine whether the sample respondents' scores follow a normal distribution. Statistical literature provides two primary normality tests: the Kolmogorov-Smirnov test (utilized when sample size exceeds 50) and the Shapiro-Wilk test (utilized when sample size is fewer than 50 cases). Because the main sample size in the present study is fewer than 50 (n = 12), the Shapiro-Wilk test was employed.

Table 3

Shapiro-Wilk Normality Test Results for Sample Responses Across Study Dimensions

Study Dimensions	Statistic (W)	df	Sig. (p-value)	Normality Decision
Dimension 1: Mitigating Stereotyped Behaviors	0.971	12	0.919	Data follow a normal distribution
Dimension 2: Achieving Social Interaction	0.936	12	0.448	Data follow a normal distribution
Dimension 3: Achieving Communication Capacity	0.890	12	0.570	Data follow a normal distribution

Note. Decision Rule: If the significance value (Sig.) exceeds α = .05, the data follow a normal distribution. Source: Prepared by the researchers based on SPSS outputs.

As evidenced in Table 3, the Shapiro-Wilk test results across the three questionnaire dimensions yielded significance values (Sig.) ranging between .448 and .919, all of which are greater than the significance threshold of α = .05. This confirms that the sample response data follow a normal distribution, thereby justifying the use of parametric statistical tests (specifically the one-sample t-test) to evaluate the study hypotheses.

3.2 Testing the First Sub-Hypothesis (H1)

The first sub-hypothesis states: 'Adapted physical activity plays a role in mitigating stereotyped behaviors among children with autism.' To test and verify this hypothesis, the arithmetic mean, standard deviation, hypothetical mean, mean difference, and one-sample t-test value were calculated, as presented in Table 4.

Table 4

One-Sample t-Test Results for the First Sub-Hypothesis (Mitigating Stereotyped Behaviors)

Analysis of Table 4 reveals that for the responses of the sample participants (n = 12 educators) regarding the first hypothesis, the arithmetic mean reached M = 17.67 with a standard deviation of SD = 2.10, compared to the hypothetical mean of 14.00. The arithmetic mean exceeds the hypothetical mean

Variable	n	Items	Max Score	M	SD	Hypothetical Mean	Mean Diff.	df	t-value	Sig. (p)
Positive Behavior (Dim. 1)	12	07	21	17.67	2.10	14.00	3.67	11	29.09	0.000

Note. M = Arithmetic Mean; SD = Standard Deviation; df = Degrees of Freedom; p < .001.

with a positive mean difference of 3.67. This indicates that adapted physical activity plays a substantial role in mitigating stereotyped behaviors among children with autism, a finding confirmed by the highly significant t-test value of t(11) = 29.09 at a significance level of p = .000. Consequently, the first sub-hypothesis is accepted, confirming that adapted physical activity plays a role in mitigating stereotyped behaviors among children with autism to a high degree.

3.3 Testing the Second Sub-Hypothesis (H2)

The second sub-hypothesis states: 'Adapted physical activity plays a role in achieving social interaction among children with autism.' To verify this hypothesis, the descriptive and inferential parameters were computed as shown in Table 5.

Table 5

One-Sample t-Test Results for the Second Sub-Hypothesis (Achieving Social Interaction)

Variable	n	Items	Max Score	M	SD	Hypothetical Mean	Mean Diff.	df	t-value	Sig. (p)
Positive Behavior (Dim. 2)	12	07	21	17.25	1.71	14.00	3.25	11	34.89	0.000

Note. M = Arithmetic Mean; SD = Standard Deviation; df = Degrees of Freedom; p < .001.

As illustrated in Table 5, the responses of the sample participants (n = 12 educators) on the second dimension yielded an arithmetic mean of M = 17.25 with a standard deviation of SD = 1.71, exceeding the hypothetical mean (14.00) by a difference of 3.25. This demonstrates that adapted physical activity plays an effective role in achieving social interaction among children with autism, corroborated by the t-test value of t(11) = 34.89 at a significance level of p = .000. Accordingly, the second sub-hypothesis is verified and accepted, confirming that adapted physical activity plays a role in achieving social interaction among children with autism to a high degree.

3.4 Testing the Third Sub-Hypothesis (H3)

The third sub-hypothesis states: 'Adapted physical activity plays a role in achieving communication capacity among children with autism.' The statistical results evaluating this hypothesis are presented in Table 6.

Table 6

One-Sample t-Test Results for the Third Sub-Hypothesis (Achieving Communication Capacity)

Variable	n	Items	Max	Rel. Weight	M	SD	Hyp. Mean	Diff.	df	t-value	Sig. (p)
Positive Behavior (Dim. 3)	12	07	21	70%	17.67	1.61	14.00	3.67	11	37.91*	0.000

Note. *In the original Arabic manuscript, the table reports t = 37.91 whereas the accompanying text cites t = 40.36; both values are statistically significant at p = .000.

Examination of Table 6 indicates that for the responses of the sample participants (n = 12 educators) regarding the third hypothesis, the arithmetic mean reached M = 17.67 with a standard deviation of SD = 1.61 and a relative weight of 70%, surpassing the hypothetical mean (14.00) by a mean difference of 3.67. This confirms that adapted physical activity plays a significant role in achieving communication

capacity among children with autism, as substantiated by the t-test value (reported as t = 37.91 in Table 6 and t = 40.36 in the text commentary) at a significance level of p = .000. Consequently, the third sub-hypothesis is verified and accepted, establishing that adapted physical activity plays a role in achieving communication capacity among children with autism to a high degree.

4. Discussion of Findings

4.1 Discussion of the First Sub-Hypothesis (Mitigating Stereotyped Behaviors)

The first sub-hypothesis posited that 'adapted physical activity plays a role in mitigating stereotyped behaviors among children with autism.' The empirical data analysis strongly supports this proposition across multiple analytical facets:

- **1. Arithmetic Mean and Standard Deviation:** Computing the descriptive statistics for the sample group revealed that the arithmetic mean of positive behavior scores (M = 17.67) is substantially higher than the hypothetical mean (14.00), accompanied by an acceptable standard deviation (SD = 2.10). This indicates a pronounced elevation in positive behavior levels—and a corresponding reduction in repetitive, stereotyped patterns—among children engaging in adapted physical activity.
- **2. t-Value and Statistical Significance:** The calculated t-statistic proved highly significant (p = .000), signifying that the observed mean differences provide robust empirical evidence that adapted physical activity mitigates stereotyped behaviors among children with autism.
- **3. Theoretical Interpretation:** Based on these results, it can be confidently asserted that a positive relationship exists between practicing adapted physical activity and reducing stereotyped behaviors in children with autism, a finding with substantial implications for methods used to support mental health in this population.
- **4. Practical Applications:** These results can be directly utilized to design specialized therapeutic programs aimed at reducing stereotyped behaviors in children with autism by incorporating adapted physical activity components as an essential pillar to achieve optimal outcomes.
- **5. Future Research Directions:** These findings underscore the necessity of conducting further longitudinal and experimental investigations to elucidate the precise neurobehavioral mechanisms through which adapted physical activity mitigates stereotyped behaviors, as well as identifying moderating variables in this relationship. In sum, the analysis confirms the importance of adapted physical activity as an integral component of comprehensive care and intervention for children with autism.

4.2 Discussion of the Second Sub-Hypothesis (Achieving Social Interaction)

The second sub-hypothesis stated that 'adapted physical activity plays a role in achieving social interaction among children with autism.' The empirical findings validate this hypothesis:

- **1. Arithmetic Mean and Standard Deviation:** The sample's arithmetic mean for social interaction scores (M = 17.25) exceeded the hypothetical mean (14.00) with an acceptable standard deviation (SD = 1.71), indicating a marked increase in social interaction levels among children participating in adapted physical activities.
- **2. t-Value and Statistical Significance:** The computed t-value was highly significant (p = .000), providing strong evidence that adapted physical activity actively contributes to achieving social interaction among children with autism.
- **3. Theoretical Interpretation:** These findings confirm a positive relationship between engaging in adapted physical activity and achieving social interaction among children with autism, aligning with the clinical findings of Ladjlat (2012) and the experimental outcomes of Ghazal (2007) regarding structured play and social skill acquisition.

- **4. Practical Applications:** These findings can inform the design of targeted therapeutic programs aimed at improving social interaction among children with autism, wherein adapted physical activity is integrated as a core therapeutic modality.
- **5. Future Research Directions:** The results suggest the importance of conducting further research to better understand the underlying mechanisms through which adapted physical activity fosters social interaction and to identify the environmental and pedagogical factors influencing this relationship.

4.3 Discussion of the Third Sub-Hypothesis (Achieving Communication Capacity)

The third sub-hypothesis posited that 'adapted physical activity plays a role in achieving communication capacity among children with autism.' The statistical evaluation confirms this relationship:

- **1. Arithmetic Mean and Standard Deviation:** Based on the empirical data, the arithmetic mean of communication capacity scores among children practicing adapted physical activity (M = 17.67) surpassed the hypothetical mean (14.00), with a low standard deviation (SD = 1.61), reflecting an elevated capacity for verbal and non-verbal communication.
- **2. t-Value and Statistical Significance:** The t-test statistic was highly significant (p = .000), demonstrating a statistically significant positive effect of adapted physical activity on communication capacity.
- **3. Theoretical Interpretation:** These findings establish that adapted physical activity contributes directly to developing communication capacity among children with autism, corroborating the clinical and experimental findings of Sahli (2012) and Khaldoumi (2012) regarding the role of recreational and musical-motor play in enhancing joint attention and communicative expression.
- **4. Practical Applications:** These outcomes can be applied to design specialized therapeutic interventions aimed at enhancing communicative competence among children with autism by embedding adapted physical activity as a foundational element.
- **5. Future Research Directions:** The findings highlight the need for continued research to examine the precise impact of specific adapted physical activity modalities on verbal and non-verbal communication channels among children across the autism spectrum.

5. Conclusion

Through a deep comprehension of the challenges posed by autism spectrum disorder and its pervasive impact on the lives of affected children, it becomes evident that adapted physical activities play a prominent role in enhancing mental health and developing social communication. This understanding reflects the urgent need to reconsider traditional therapeutic and intervention paradigms for these children, and to recognize adapted physical activity as an essential component of comprehensive treatment and rehabilitation strategies.

Throughout this study, robust empirical evidence was presented supporting both the general hypothesis and the three sub-hypotheses, affirming the role of adapted physical activity in improving the quality of life of children affected by autism. These findings indicate that attending to the motor and physical dimensions of these children contributes substantially to improving their environmental adaptation and strengthening their social capacities.

This scientific symposium represents a vital starting point toward raising institutional awareness regarding the importance of adapted physical activity in treating children with autism. This awareness must catalyze sustained efforts to develop and implement structured programs and initiatives that reinforce this positive role and achieve the ultimate objective: enhancing the quality of life for these children and empowering them to achieve effective inclusion within society.

In conclusion, continuous reflection and collaborative efforts are required from all concerned stakeholders—educators, clinicians, policymakers, and families—to develop comprehensive, innovative

strategies that account for the motor and physical dimensions of children with autism.Sustained research and development in this domain hold the promise of achieving substantial progress in improving the lives of these children and enabling them to realize their full human potential within our society.

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